BioMap and Living Waters

Guiding Land Conservation for Biodiversity in Massachusetts

Core Habitats of Bernardston

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is not intended for use in state regulations.

Produced by:

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

Produced in 2004

BioMap and Living Waters:
Guiding Land Conservation for Biodiversity in Massachusetts

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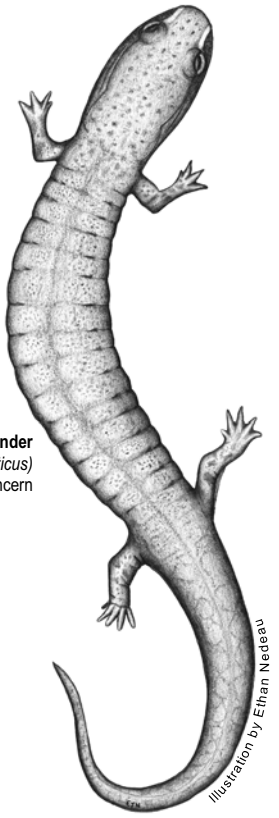
* Depending on the location of Core Habitats, your city or town may not have all of these sections.



Spring Salamander
(Gyrinophilus porphyriticus)
Species of Special Concern

Funding for this project was made available by the Executive Office of Environmental Affairs, contributions to the Natural Heritage & Endangered Species Fund, and through the State Wildlife Grants Program of the US Fish & Wildlife Service.

Natural Heritage & Endangered Species Program

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For more information on rare species and natural communities, please see our fact sheets online at ***www.nhesp.org***

BioMap and Living Waters:
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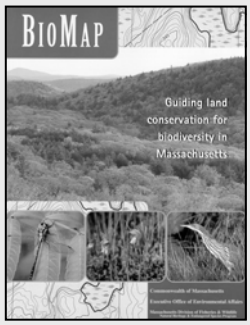
Introduction

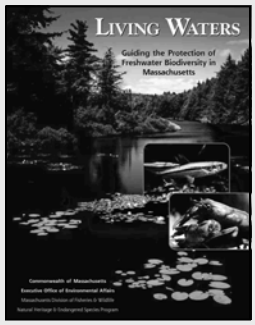
In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generatons to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, ***BioMap*** and ***Living Waters***. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

What is a Core Habitat?

Both BioMap and Living Waters delineate ***Core Habitats*** that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.





Get your copy of the ***BioMap*** and ***Living Waters*** reports! Contact Natural Heritage at 508-792-7270, Ext. 200 or email natural.heritage@state.ma.us. Posters and detailed technical reports are also available.

Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the ***riparian areas***, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as ***Supporting Natural Landscape*** provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was

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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, ***Critical Supporting Watersheds*** highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

Understanding Core Habitat Species, Community, and Habitat Lists

What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant

Table 1. The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

BioMap

	Species and Verified Natural Community Types	
Biodiversity Group	**Included in BioMap**	**Total Statewide**
Vascular Plants	246	1,538
Birds	21	221 breeding species
Reptiles	11	25
Amphibians	6	21
Mammals	4	85
Moths and Butterflies	52	An estimated 2,500 to 3,000
Damselflies and Dragonflies	25	An estimated 165
Beetles	10	An estimated 2,500 to 4,000
Natural Communities	92	> 105 community types

Living Waters

	Species	
Biodiversity Group	**Included in Living Waters**	**Total Statewide**
Aquatic Vascular Plants	23	114
Fishes	11	57
Mussels	7	12
Aquatic Invertebrates	23	An estimated > 2500

species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

What does 'Status' mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations, 321 CMR 10.00. Rare species are categorized as Endangered, Threatened, or of Special Concern according to the following:

- ***Endangered*** species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- ***Threatened*** species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- ***Special Concern*** species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition, the Natural Heritage & Endangered Species Program maintains an unofficial ***watch list*** of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- ***Critically Imperiled*** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- ***Imperiled*** communities typically have 6-20 sites or few remaining acres in the state.
- ***Vulnerable*** communities typically have 21-100 sites or limited acreage across the state.
- ***Secure*** communities typically have over 100 sites or abundant acreage across the state; however excellent examples are identified as Core Habitat to ensure continued protection.

Legal Protection of Biodiversity

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The ***Massachusetts Natural Heritage Atlas*** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

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Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific ***fact sheets*** at www.nhesp.org.

Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

Additional Information

If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program:

by Phone *508-792-7270, Ext. 200*

by Fax: *508-792-7821*

by Email: *natural.heritage@state.ma.us*.

by Mail: *North Drive*
Westborough, MA 01581

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
  - Field guides
  - Natural Heritage Atlas, and more!

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BioMap: Species and Natural Communities

Bernardston

Core Habitat BM70

Natural Communities

Common Name	Scientific Name	Status
Black Gum Swamp		Imperiled

Invertebrates

Common Name	Scientific Name	Status
Early Hairstreak	*Erora laeta*	Threatened

Core Habitat BM120

Invertebrates

Common Name	Scientific Name	Status
New England Bluet	*Enallagma laterale*	Special Concern

Core Habitat BM201

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

BioMap: Core Habitat Summaries

Bernardston

Core Habitat BM70

This Core Habitat contains a large, unfragmented area of Northern Hardwoods Forest that contains habitat for the Early Hairstreak butterfly, as well as a complex of Black Gum Swamps. While part of this Core Habitat is within the Satan's Kingdom Wildlife Management Area, the remainder appears to be unprotected.

Natural Communities

This Core Habitat includes a complex of small, good-quality Black Gum Swamps occurring within a large area of forested upland. Black Gum Swamps are forested acidic basin wetlands with accumulations of peat that form hummocks and hollows on the ground. Black Gum is the dominant canopy tree, growing primarily on the hummocks, which results in a relatively open canopy.

Invertebrates

This Core Habitat includes a large area of relatively unfragmented Northern Hardwoods Forest with a complement of Beech that is habitat for the Early Hairstreak butterfly.

Core Habitat BM120

Invertebrates

This Core Habitat includes the Sawyer Ponds, Lily Pond, and other wetlands to the northwest, all of which provide habitat for the New England Bluet damselfly, which is native to this region. The habitat is located in a relatively undeveloped and unfragmented landscape. A small portion of this Core Habitat is within Satans Kingdom Wildlife Management Area, but most of it appears to be unprotected.

Living Waters: Species and Habitats

Bernardston

Core Habitat LW005

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Core Habitat LW011

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Core Habitat LW183

Exemplary Habitats

Common Name	Scientific Name	Status
Fish Habitat		----------

Core Habitat LW354

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Plants

Common Name	Scientific Name	Status
American Waterwort	*Elatine americana*	Endangered
Water Star-grass	*Heteranthera dubia*	Watch Listed

Invertebrates

Common Name	Scientific Name	Status
Brook Floater	*Alasmidonta varicosa*	Endangered
Creeper	*Strophitus undulatus*	Special Concern
Eastern Pondmussel	*Ligumia nasuta*	Special Concern
Triangle Floater	*Alasmidonta undulata*	Special Concern

Yellow Lampmussel	*Lampsilis cariosa*	Endangered

Fishes

Common Name	Scientific Name	Status
Burbot	*Lota lota*	Special Concern
Eastern Silvery Minnow	*Hybognathus regius*	Special Concern
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered

Core Habitat LW421

Exemplary Habitats

Common Name	Scientific Name	Status
Invertebrate Habitat		----------

Living Waters: Core Habitat Summaries

Bernardston

Core Habitat LW005

This Core Habitat is a tributary to Mill Brook in Bernardston. Its crystal clear waters flow moderately slowly over the cobble streambed. The stream supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The presence of this invertebrate community indicates the stream habitats here are relatively free of the impacts of development. Forested stream banks help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

Core Habitat LW011

In this Core Habitat, Dry Brook's clear waters flow swiftly over the stream's cobble bottom. The brook supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies and caddisflies. The presence of this invertebrate community indicates the stream habitats here are relatively free of the impacts of development. Forested stream banks help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

Core Habitat LW183

This section of Shattuck Brook is a good example of a cold, fast-flowing, rocky, and high gradient freshwater habitat. Here the fish community consists of Blacknose Dace, Brook Trout, Longnose Dace, Slimy Sculpin, and White Sucker. All of these species require clean, rocky substrates for spawning, which indicates the high quality of this aquatic Core Habitat.

Core Habitat LW354

This middle section of the Connecticut River flows through a mix of developed, agricultural, and forested lands, and is bounded by the Holyoke dam to the south, and the Tuners Falls dam to the north. The river provides unparalleled freshwater habitats for fishes and invertebrates in Massachusetts.

The river is of conservation significance because it supports the only known occurrence of the Endangered Yellow Lampmussel in Massachusetts. This freshwater mussel lives in large rivers, and was recently rediscovered in the mainstem of the Connecticut River at depths of up to fifteen feet. In the past, the Connecticut River was known to support eleven mussel species, and today there are nine species known from the river.

The Bachelor Brook tributary in Granby and South Hadley also supports a very diverse assemblage of freshwater mussels, including eight of the twelve species found in Massachusetts. Four of these species are state-listed as rare: the Endangered Brook Floater, the Triangle Floater, the Eastern Pondmussel, and the Creeper mussel. These species have generally been found in moderate to slow flowing stretches of the brook below rocky riffles in either mixed sand and gravel runs or in sandy pools. The Brook Floater in particular is believed

to be sensitive to low oxygen, pollution, and silt, and is known from only five water bodies in the state. There is some evidence that this small Brook Floater population is reproducing, making this a particularly important site.

Stony Brook in South Hadley supports five freshwater mussel species, including the rare Creeper mussel. This species is found scattered along the lower reach of Stony Brook, near the confluence with the Connecticut River, as it flows slowly over loose sands, gravels, and clays. There are only nineteen Core Habitats for the Creeper, which represent the water bodies that support the most robust populations of this rare mussel across the state.

From Holyoke northward, the Connecticut River mainstem is also home to ten species of state-listed dragonflies, the majority of which are found only in large rivers. The tributaries of the Connecticut River are important habitat for the state-listed dragonflies found in smaller rivers. The Connecticut River and the Connecticut River Valley provide a northward corridor for more southerly species, thus contributing a unique fauna to Massachusetts.

In addition to invertebrate habitats, the Connecticut River supports a diversity of fish habitats. The stretch of the Connecticut River in Montague is an important spawning (breeding) area for the state- and federally-Endangered Shortnose Sturgeon. This long-lived, prehistoric-looking fish is particularly susceptible to habitat degradation and mortality because it does not reach maturity until it is at least 5 - 10 years old. The Shortnose Sturgeon moves many miles during its life cycle, using other parts of the Connecticut River at different times of the year. The stretch of the river from Montague and Deerfield down to Hatfield and Hadley is important feeding and overwintering habitat.

In Hatfield, Hadley, and Northampton, a portion of the Connecticut River and its associated tributaries were delineated as Core Habitat for the Eastern Silvery Minnow, a fish Species of Special Concern. This species is only known from the Connecticut River and lower Deerfield River in Massachusetts. It spawns in backwaters, laying eggs directly on the river bottom in areas where the emergent vegetation provides cover. Siltation, pollution, and water level changes threaten this species.

The stretch of the Connecticut River in Gill, Greenfield, and Montague downstream from the Turners Falls Dam is presumed habitat for Burbot, a fish Species of Special Concern. Burbot also likely inhabits the Connecticut River in the vicinity of the Fort River confluence in Hadley. This enigmatic fish, a freshwater member of the cod family, has been found at only a few locations in Massachusetts. Not much is known about its life history in the state, although it may live mostly in deep pools of the Connecticut River.

Shallow areas in the Connecticut River north of the Sunderland bridge support a population of the diminutive American Waterwort, an Endangered aquatic plant. This area also supports the uncommon Water Star-Grass, a plant with tiny yellow flowers and long grass-like leaves. Native freshwater plants like these species are an important component of aquatic ecosystems. They provide habitat and nutrition for fish and invertebrates, and they add oxygen to the water through photosynthesis. Permanent protection of the riparian land adjacent to this Core Habitat, and careful management of runoff from developed and agricultural areas will help ensure the continued quality of this key Core Habitat in Massachusetts.

Living Waters: Core Habitat Summaries

Bernardston

Core Habitat LW421

This tributary to Fall River flows through an unprotected landscape the remains undeveloped except for Bald Mountain Road, a dirt road that parallels the stream. The Core Habitat supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The presence of this invertebrate community indicates the stream habitats here are relatively free of the impacts of development. The streambed's mix of boulders, cobbles, pebbles, gravels, and sands provide excellent habitat for these aquatic invertebrates. Forested stream banks help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

Help Save Endangered Wildlife!

Please contribute on your Massachusetts income tax form or directly to the

Natural Heritage &
Endangered Species Fund

To learn more about the Natural Heritage & Endangered Species Program and the Commonwealth's rare species, visit our web site at: www.nhesp.org.